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Ueda et al.

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(54) **OPENER CAP**

(71) Applicant: **KEY COFFEE INC.**, Tokyo (JP)

(72) Inventors: **Hiromitsu Ueda**, Yokohama (JP); **Masahiro Takenaka**, Yokohama (JP); **You Yamamori**, Yokohama (JP); **Kazuo Kawamata**, Tokyo (JP); **Takeshi Sou**, Tokyo (JP); **Syouzo Fujii**, Tokyo (JP)

(73) Assignee: **KEY COFFEE INC.**, Tokyo (JP)

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B65D 17/50	(2006.01)
B67B 7/00	(2006.01)
B65D 17/00	(2006.01)

(52) **U.S. Cl.**

CPC ***B65D 51/228*** (2013.01); ***B65D 17/18*** (2013.01); ***B65D 17/50*** (2013.01); ***B65D 51/226*** (2013.01); ***B67B 7/24*** (2013.01)

(58) **Field of Classification Search**

CPC B65D 51/228; B65D 43/02; B65D 51/22; B65D 2251/0015; B65D 17/18; B65D 17/50; B65D 17/506; B65D 43/06; B65D 43/08; B67B 7/26; B67B 7/24

USPC 220/277, 278, 258.4, 259.3; 222/81, 83; 206/222

See application file for complete search history.

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Primary Examiner — Fenn Mathew
Assistant Examiner — James N Smalley
(74) *Attorney, Agent, or Firm* — Westerman, Hattori, Daniels & Adrian, LLP

(57) **ABSTRACT**

The purpose of the invention is to provide a very safe opener cap that can easily open a film serving as a section to be opened without scattering the contents. A can body (**10**) and a screw cap (**20**) are screwed together, and the screw cap (**20**) and an opener (**30**) are ratcheted together so as to rotate as a unit in the direction of the screw cap (**20**) tightening. Blade angles of an annular blade (**34**) are configured so that the blade angle in the direction of the screw cap (**20**) loosing is gentler than the blade angle in the direction of tightening.

7 Claims, 7 Drawing Sheets

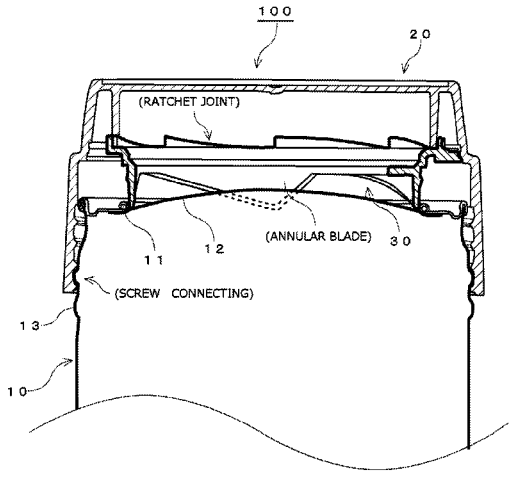

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Fig. 1

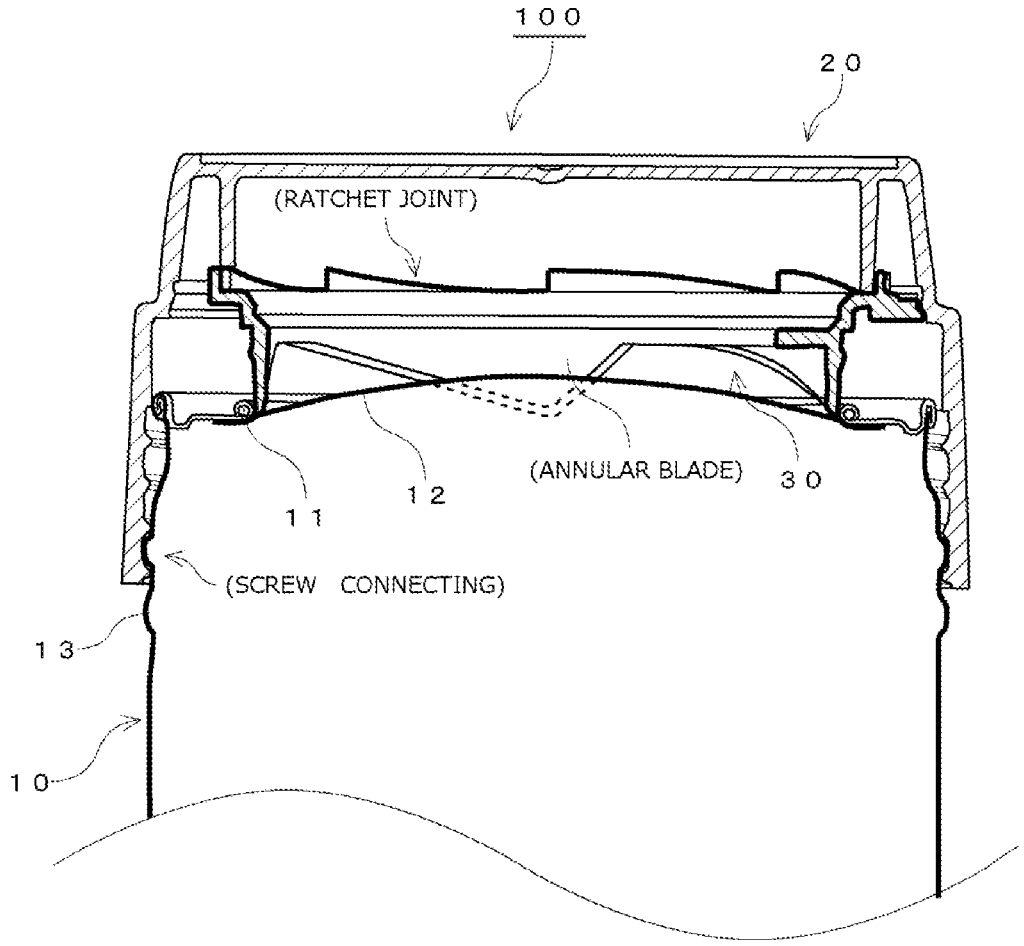

100
20
(RATCHET JOINT)
(ANNULAR BLADE)
30
11
12
(SCREW CONNECTING)
13
10

Fig. 2

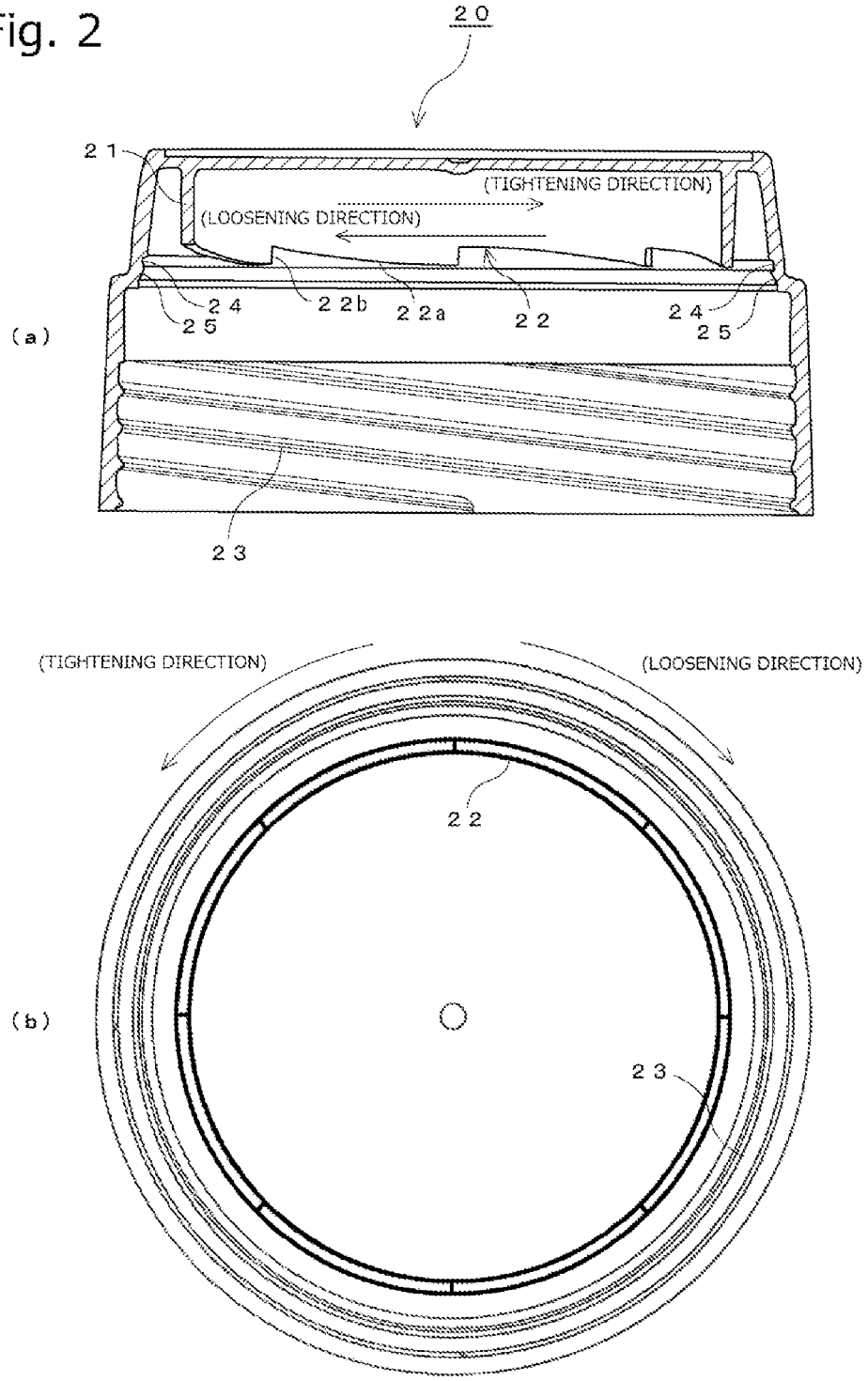

20
21
(TIGHTENING DIRECTION)
(LOOSENING DIRECTION)
24
25
22b
22a
22
24
25
(a)
23
(TIGHTENING DIRECTION)
(LOOSENING DIRECTION)
22
(b)
23

Fig. 3

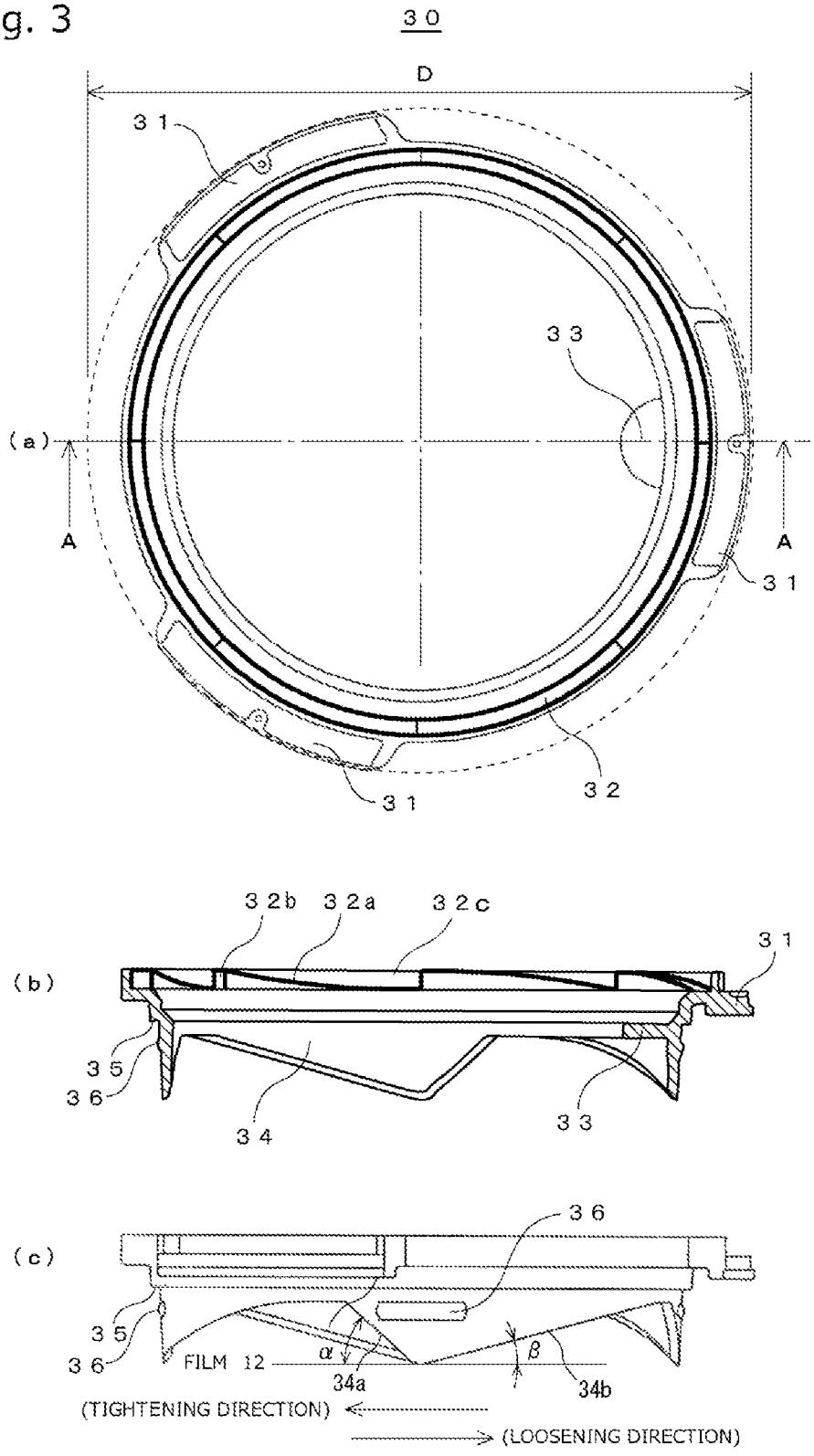

30
D
31
33
(a)
A
A
31
31
32
32b
32a
32c
31
(b)
35
36
34
33
(c)
36
35
36
FILM 12
α
34a
β
34b
(TIGHTENING DIRECTION)
(LOOSENING DIRECTION)

Fig. 4

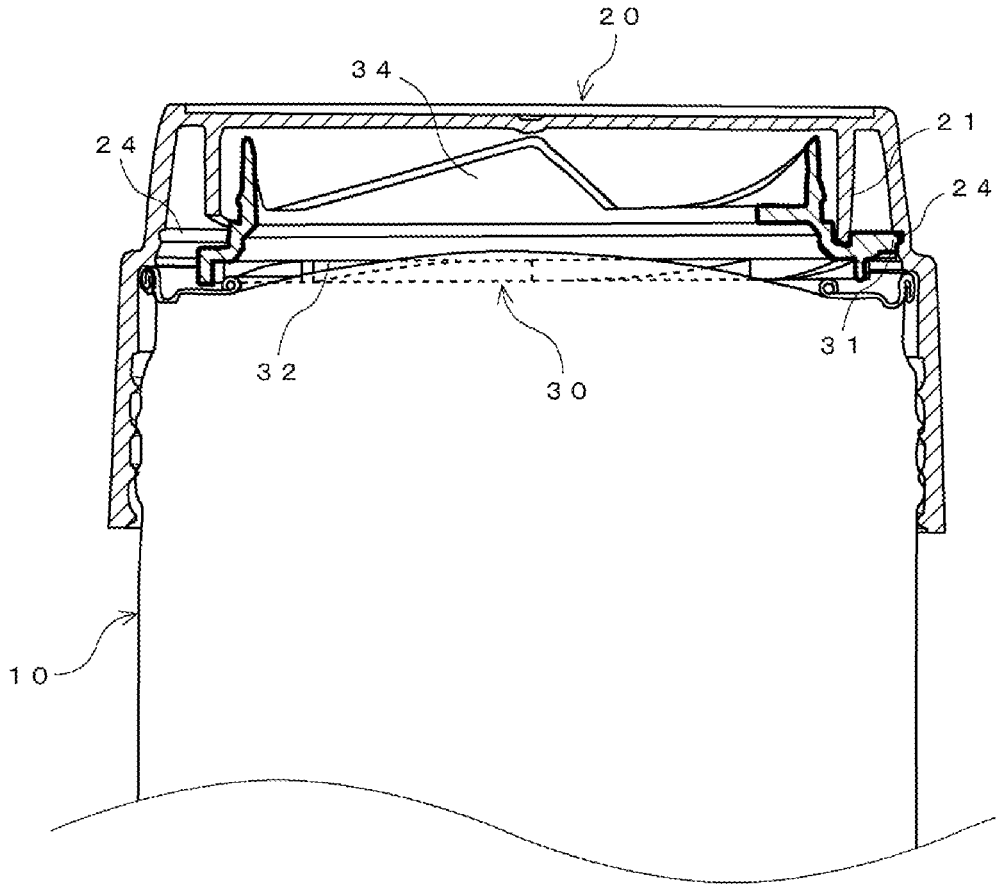


Fig. 5

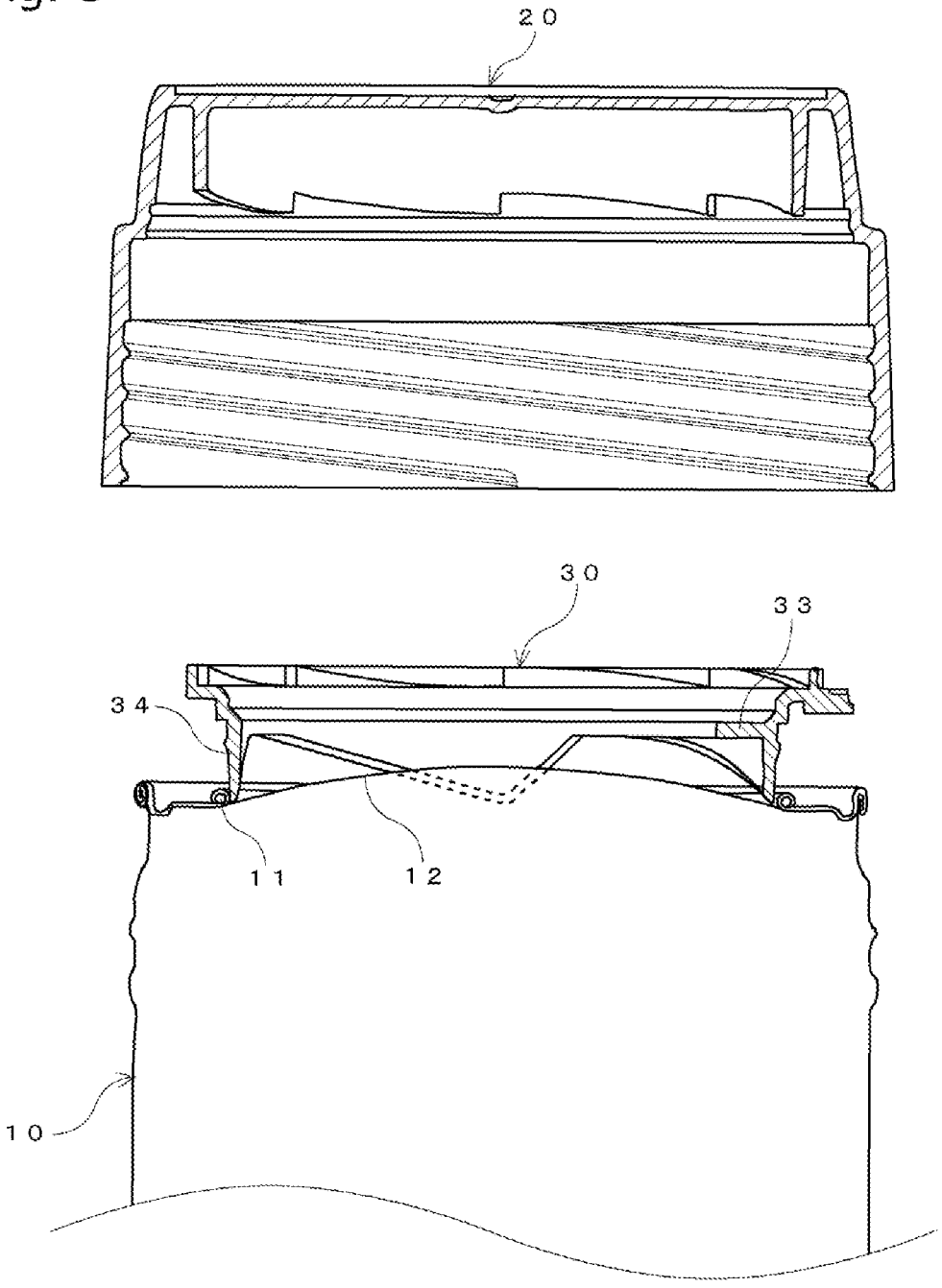


Fig. 6

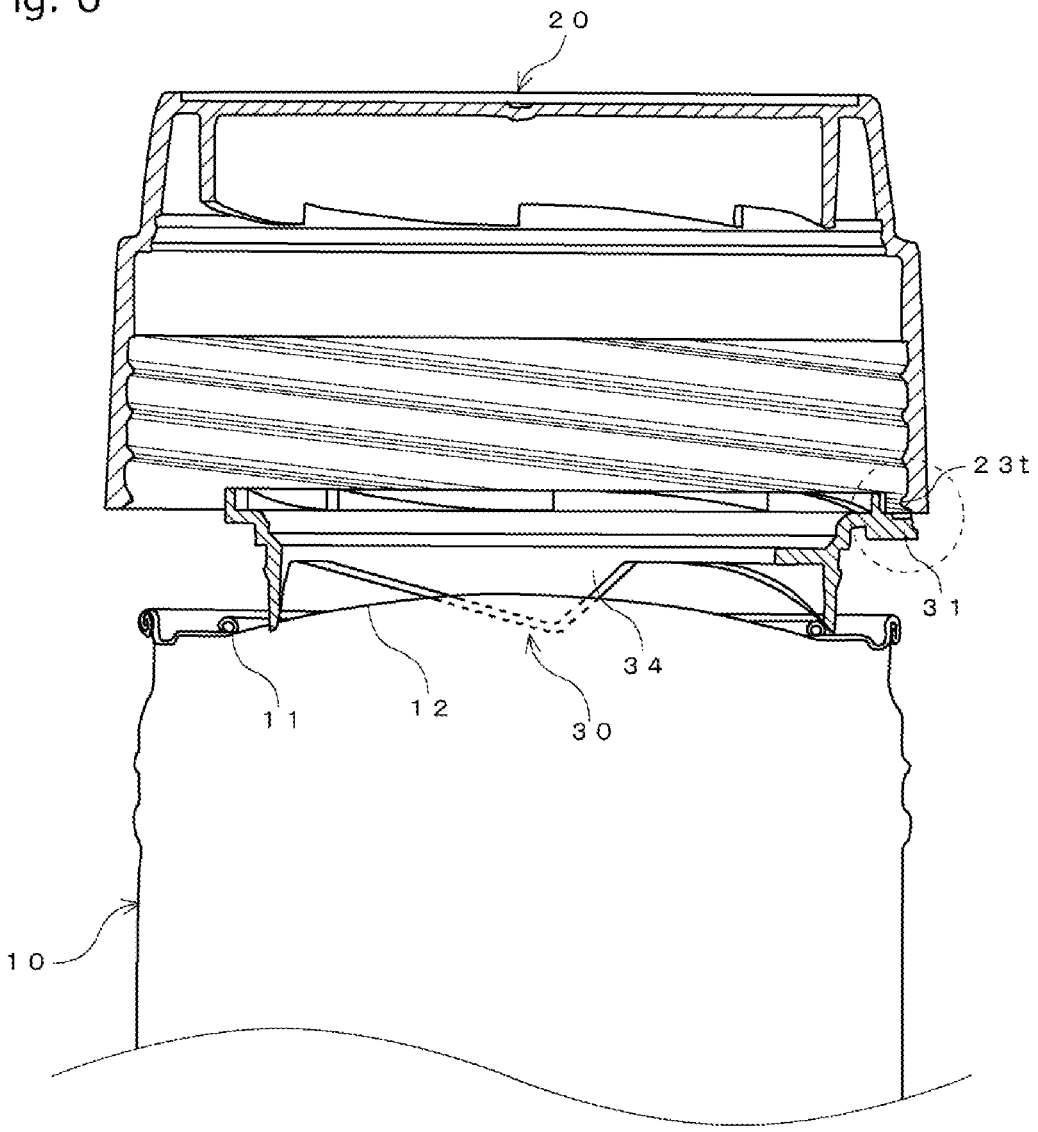
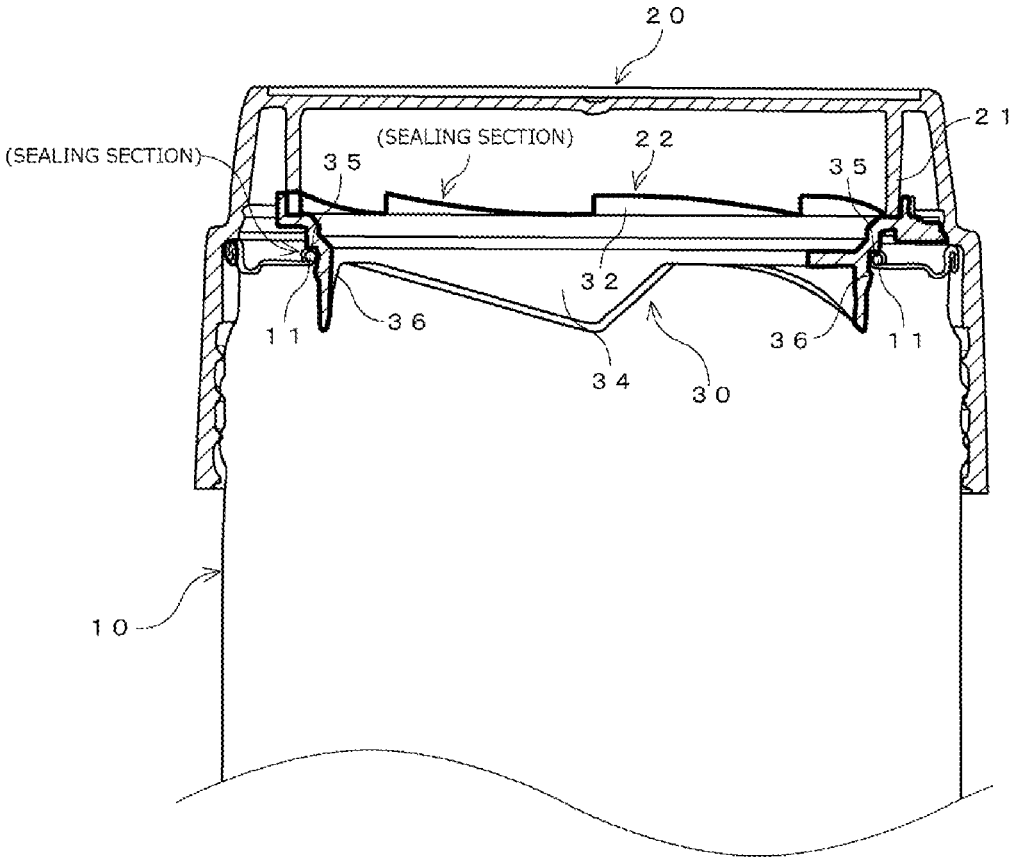


Fig. 7


20
21
(SEALING SECTION)
(SEALING SECTION)
22
35
35
32
11
36
36
11
34
30
10

OPENER CAP

TECHNICAL FIELD

The present invention relates to a cap having an opener for opening a container sealed by a multilayer film or the like, including an aluminum foil layer, and also for maintaining sealing after the opening of the container, and more particularly to a highly safe opener cap that can easily open a film at a section to be opened without scattering the contents of the container.

BACKGROUND ART

Containers (cans) for storing, for example, coffee beans and ground coffee are recapped many times with over-caps for repeated use. Among such cans, there is known a can in which a section to be opened of a can upper lid is partitioned by an annular curled section and the inner side of the annular curled section is tightly sealed from a can lid rear surface by a gas barrier multilayer synthetic resin film including an aluminum foil layer. As a method of cutting and opening the film of the upper lid of such a can, there is known a method of cutting based on a screw configured such that a female screw is formed on the inner circumferential surface of a lower part of an over-cap and a male screw is formed on the outer circumferential surface of an upper part of a can main body, a cutter in a folded state is mounted on a top plate rear surface of the over-cap, and the over-cap is screwed into the can main body after the cutter is raised up, whereby the over-cap is displaced downward while rotating and the cutter pierces into and cuts the film in a circular shape (see, for example, Patent Document 1). In such an over-cap opener of the screw type, the cutter is mounted on the over-cap in the folded state and needs to be raised up by a fingertip when the can is opened. After being raised up once, the cutter is always in a projected state from the top plate rear surface of the over-cap. Therefore, there is a risk that a user's finger is cut when the user opens and closes and uses the over-cap.

There is also proposed open cap openers in which an opener configured by an annular cutter having an annular blade is formed separately from an over-cap and the annular cutter for cutting, in opening a film, the film in a circular shape by gripping the opener by fingers, directly piercing the annular blade into a film, and directly rotating the opener in that state and a crowned over-cap are combined (see, for example, Patent Documents 2 and 3). Among such open cap openers by the annular cutter, the open cap opener described in Patent Document 2 is an open cap opener of a type in which, after the film opening, the opener is housed on the inner side of the over-cap in a posture in which the annular blade faces the top plate rear surface of the over-cap. The open cap opener described in Patent Document 3 is an open cap opener of a type in which the opener is not housed on the inner side of the over-cap after the film cutting and, after the film is cut, the film is left in a state in which the opener is fit in the annular curled section of the can upper lid (i.e., a state in which the annular blade faces the inside of the can main body). In the open cap openers, since the annular blade is not exposed to the outside after the opening, it is possible to eliminate the risk that the finger is cut by the annular blade when the over-cap is removed from the can main body.

PRIOR ART

Patent Document

Patent Document 1: Japanese Patent Application Laid-Open No. 2004-168318

Patent Document 2: Japanese Patent Application Laid-Open No. 2006-27732

Patent Document 3: Japanese Patent Application Laid-Open No. 2010-30620

DISCLOSURE OF THE INVENTION

Problem to be Solved by the Invention

In all the open cap openers in the past, the opening by the annular cutter (the opener) is performed by gripping the opener itself by fingers, pushing the annular blade into the film, and then rotating the annular blade to cut a film piece in a circular shape to open the film. However, a gripping section of the opener has only an outer diameter as small as the annular curled section of the can upper lid. Therefore, there is a problem in that a portion gripped by the user is insufficient, it is hard to apply force to the opener, and, as a result, it is hard to perform opening operation for the film. If the container is a coffee beans/ground coffee can or the like and is a so-called positive pressure can in which an inert gas is filled for oxidation prevention for contents or a carbon dioxide gas emitted from coffee of the contents is also added and a can internal pressure is set higher than the atmospheric pressure, there is a problem in that, in the opening by the annular opener in the past, when the annular blade of the opener is pushed into the film, the inert gas blows out and the contents scatter to the outside.

Therefore, the present invention has been devised in view of such problems of the related art and it is an object of the present invention to provide a highly safe opener cap that is easily gripped and easily loosened and can easily open a film in a section to be opened without scattering contents.

Means for Solving Problem

In order to attain the object, an opener cap recited in claim **1** includes a combination of a semi-conical or cylindrical screw cap including a female screw to be joined with a male screw formed in a side-surface upper part of a can main body and an opener including an annular blade for cutting a film serving as a section to be opened formed in an upper lid of the can main body, the opener being formed to remain in the opening of the upper lid after opening of the film. At an opening end of a cylinder rib formed on a top plate rear surface of the screw cap and an opening end of the opener on the opposite side of the annular blade, upper ratchet teeth and lower ratchet teeth meshing with each other only in a tightening direction of the screw cap are respectively formed.

In the opener cap, the screw cap and the opener configure a ratchet joint that integrally rotates and descends only in the cap tightening direction, that is, a direction in which the screw cap is screwed into the can main body.

Therefore, unlike a mechanism for rotating the annular cutter (the opener) alone to open the film in the past, the annular blade of the opener cuts the film of the can upper lid while piercing into the film to form an opening in the can upper lid.

In the opener cap recited in claim **2**, the upper ratchet teeth and the lower ratchet teeth mesh with each other subsequent to the start of meshing of the female screw of the screw cap and the male screw of the can main body.

In the opener cap recited in claim **3**, the upper ratchet teeth of the screw cap and the lower ratchet teeth of the opener are formed in a relation in which the upper ratchet teeth and the lower ratchet teeth can come into contact with each other over entire circumferences thereof.

In the opener cap recited in claim **4**, a maximum envelope diameter of the opener is set slightly smaller than a minimum inner diameter of ridge sections of the female screw of the screw cap.

In the opener cap recited in claim **5**, the annular blade of the opener is an asymmetrical blade, a blade angle of which in a loosening direction of the screw cap is set smaller than a blade angle in a tightening direction of the screw cap.

Effects of the Invention

In the opener cap of the present invention recited in claim **1**, the can main body and the screw cap are joined by screws and the screw cap and the opener configure the ratchet joint that integrally rotates only in the tightening direction of the screw cap. Therefore, simply by screwing the screw cap into the can main body in the opening operation for the film, the opener cuts the film of the can upper lid in a circular shape. Therefore, in the opening operation, since a gripping portion of the user is the screw cap, it is possible to secure the gripping portion and a rotation radius larger than a gripping portion and a rotation angle in turning the opener alone in the past. It is easy to apply force to the screw cap in turning the screw cap. It is easy to perform opening operation for the film.

Further, the opening operation for the film is performed in a state in which the screw cap is put over the can upper lid. Therefore, contents do not scatter to the outside of the screw cap when the film is opened.

Further, the opener remains in the opening of the can upper lid after the film opening. However, since both the ratchet teeth do not mesh with each other in the loosening direction of the screw cap, even when a user removes the screw cap from the can main body, the opener does not come off the can main body. Therefore, the opener remains in the opening of the can lid in a posture in which the blade is always directed to the inside of the can main body and covers a cutting blade of the film. Therefore, the opener cap is safe because the risk of cutting the user's finger during use of the opener decreases.

According to the invention recited in claim **2**, since the screw cap and the opener configure the ratchet joint with a delay after the start of the screw fastening of the screw cap to the can main body, in addition to the effect explained above, first, the screw cap and the can main body are joined by screws, whereby an axis of the screw cap serving as a reference when the opener opens the film is determined. The screw cap and the opener are joined by ratchets with a delay, whereby an axis of the opener is determined. Consequently, centering of the opener is suitably performed simply by screwing the screw cap into the can main body. The opening of the film by the opener is stably and accurately performed.

Further, according to the invention recited in claim **3**, since the ratchet joint is configured such that the ratchet teeth come into contact with each other over the entire circumference, it is possible to stably perform the opening operation for the film. In addition, by screwing the screw cap into the can main body, the ratchet joint section and a joined section of the opener and the opening of the can upper lid function as sealing sections to seal the can main body. Consequently, after the film opening, sealability (resealability) of the can main body is retained. As a result, for example, even when the can turns over, the contents do not spill over the can lid.

Further, according to the invention recite in claim **4**, the maximum envelope diameter of the opener is configured to be slightly smaller than the minimum inner diameter of the ridge sections of the female screw of the screw cap. Consequently, even when the axis of the opener is set to deviate from the axis of the screw cap, any one of the (screw) ridge sections of the female screw of the screw cap hits a protruding part of the opener, whereby the deviation of the axis of the opener is corrected. The opener acts to return the axis to a correct position.

According to the invention of claim **5**, since the blade angle of the annular blade of the opener on the opposite side of the tightening direction is set small, the blade in the loosening direction (the rear blade) traces and closes a cut end of the film cut by the blade in the tightening direction (the front blade). In the film opening operation, scattering of the contents to the outside is suitably suppressed. Since the blade is the asymmetrical blade, as a result, the blade is long in the circumferential direction and there is a margin in strength. Therefore, even if the blade is reduced in thickness, the original strength is retained. That is, it is possible to reduce the thickness of the blade to improve cutting properties and reduce an amount of use of a material.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a sectional explanatory diagram at the time when an opener cap according to an embodiment of the present invention is attached to a can main body and opening is started.

FIGS. **2**A and **2**B show a screw cap according to the embodiment of the present invention, wherein FIG. **2**A is a sectional view and FIG. **2**B is a bottom view.

FIGS. **3**A to **3**C show an opener according to the embodiment of the present invention, wherein FIG. **3**A is a plan view, FIG. **3**B is an A-A sectional view of FIG. **3**A, and FIG. **3**C is a front view.

FIG. **4** is a sectional explanatory diagram in a factory shipment time (unused) state in which the opener cap according to the embodiment of the present invention is attached to the can main body.

FIG. **5** is a sectional explanatory diagram showing an opener cap in a film opening operation process for a container.

FIG. **6** is a sectional explanatory diagram showing correction of deviation of an axis with respect to the opener.

FIG. **7** is a sectional explanatory diagram showing the opener cap after film opening.

EXPLANATION OF REFERENCE NUMERALS

10 Can main body
11 Annular curled section
12 Film
13 Male screw
20 Screw cap
21 Cylinder rib
22 Upper ratchet teeth
23 Female screw
24 Opener fitting annular groove
25 Opener contact taper surface
30 Opener
31 Cap fitting projections
32 Lower ratchet teeth
33 Finger hook section
34 Annular blade
35 Step surface
36 Can fitting projection
37 Cap fitting recess
100 Opener cap

BEST MODE FOR CARRYING OUT THE INVENTION

The present invention is explained more in detail below with reference to an embodiment shown in the figures.

FIG. **1** is a main part sectional explanatory diagram showing an opener cap **100** according to an embodiment of the

present invention. Note that this figure shows a state immediately before an opener **30** opens a film **12** of a can main body **10** (immediately before film opening).

The opener cap **100** of the present invention is configured by: a screw cap **20** configured to be fastened to the can main body **10** by screws to repeatedly cover resealably an entire upper lid of the can main body **10** and joined to the opener **30** by ratchets to transmit a rotation force of a user to the opener **30** in the film opening, and, after the film opening, cooperate with the opener **30** to display a seal function; and the opener **30** configured to be joined to the screw cap **20** by ratchets and cut the film **12** of the can main body **10** in a circular shape while integrally rotating and descending in the film opening and, after the film opening, lock to and remain in an opening (an annular curled section **11**) of the can upper lid.

The configuration of the can main body **10** is not specifically limited. However, in this embodiment, the can main body **10** is a three-piece can formed by a can lid, a can body, and a can bottom (not shown in the figure). The can lid and the can body or the can bottom and the can body are respectively doubly wound and tightened and hermetically joined at the circumferential end. The can main body **10** is a so-called positive pressure can. An inert gas (e.g., a nitrogen gas or a carbon dioxide gas) is encapsulated for oxidization prevention for contents. The internal pressure of the can main body **10** is set slightly higher than the atmospheric pressure. An inner side portion (a section to be opened) of the annular curled section **11**, which is an opening of the can upper lid, is tightly sealed from the rear surface of the can upper lid by a gas barrier multilayer synthetic resin film (the film **12**) including an aluminum foil layer. The film **12** is swelled in a dome shape by the inert gas in the inside. As explained below, the user screws the screw cap **20** into the can main body **10**, whereby the opener **30** joined with the screw cap **20** by ratchets in a tightening direction integrally rotates and descends. The film **12** is cut in a circular shape by an annular blade of the opener **30**.

A male screw **13** joining with a female screw of the screw cap **20** is formed on an upper outer circumferential surface of the can main body **10**. Therefore, the screw cap **20** is turned in the clockwise direction (the screw tightening direction) viewed from above, whereby the screw cap **20** is displaced downward while maintaining the axis of the screw cap **20** fixed with respect to the can main body **10**. As a result, as explained below, the opener **30** joined by ratchets in the tightening direction also rotates integrally with the screw cap **20** and is displaced downward while maintaining the axis of the opener **30** fixed. The opener **30** pierces into the film **12** and cuts the film **12** in a circular shape. In this way, the user screws the screw cap **20** into the can main body **10**, whereby centering of the opener **30** during the film opening is suitably performed. The opening of the film **12** by the opener **30** is stably and accurately performed.

FIGS. **2**A and **2**B are explanatory diagrams showing the screw cap **20** according to the embodiment of the present invention.

As shown in FIG. **2**A, a cylinder rib **21** is formed on a top plate rear surface of the screw cap **20**. Upper ratchet teeth **22**, which engage with lower ratchet teeth **32** of the opener **30** explained below, are formed at an opening end of the cylinder rib **21**. A female screw **23**, which joins with the male screw **13** of the can main body **10**, is formed on a lower inner circumferential surface of the cylinder rib **21**.

An opener fitting annular groove **24** for safely housing and locking the opener **30** in the cap in a reversed state before use (during factory shipment) is formed on an upper inner circumferential surface of the cylinder rib **21** (see FIG. **4**). An opener contact taper surface **25**, with which the opener **30** comes into contact upon film opening, is formed below the opener fitting annular groove **24** (see FIG. **1**). The opener contact taper surface **25** stabilizes the ratchet joint of the screw cap **20** and the opener **30** when the screw cap **20** is screwed into the can main body **10**.

In the upper ratchet teeth **22**, the ratchet teeth are formed by inclined surfaces **22***a* and vertical surfaces **22***b*. In this embodiment, as shown in FIG. **2**B, the upper ratchet teeth **22** are formed by eight ratchet teeth. When the screw cap **20** rotates in the clockwise direction (the tightening direction), the vertical surfaces **22***b* mesh with vertical surfaces **32***b* of the lower ratchet teeth **32** of the opener **30** and the screw cap **20** and the opener **30** integrally rotate. On the other hand, when the screw cap **20** rotates in the counterclockwise direction (a loosening direction), the inclined surfaces **22***a* and inclined surfaces **32***a* of the lower ratchet teeth **32** of the opener **30** slip on each other. The screw cap **20** and the opener **30** do not integrally rotate.

The upper ratchet teeth **22** come into contact with the lower ratchet teeth **32** of the opener **30** over the entire circumference of the cylinder rib **21**. The upper ratchet teeth **22** suitably prevent the contents from spilling from the can main body **10** after the film opening in conjunction with a joined section (see FIG. **7**) of the opener **30** and the annular curled section **11**.

FIGS. **3**A to **3**C are explanatory diagrams showing the opener **30** according to the embodiment of the present invention.

As shown in FIG. **3**A, cap fitting projections **31**, which fit with the screw cap **20**, are formed in three places of an outer circumferential end. Before use (during the factory shipment), the cap fitting projections **31** fit in the opener fitting annular groove **24** of the screw cap **20** in an upside down state of the opener and suitably stabilize the posture of the opener **30** in housing the opener **30** in the inside of the screw cap **20**. On the other hand, during the film opening, the cap fitting projections **31** come into contact with the opener contact taper surface **25** of the screw cap **20** and suitably stabilize the ratchet joint of the opener **30** and the screw cap **20** in screwing the screw cap **20** into the can main body **10**.

As shown in FIG. **3**B, lower ratchet teeth **32**, which engage with the upper ratchet teeth **22** of the screw cap **20**, are formed on one side of an opening end of the opener **30** (an upper side during the opening operation). Note that, like the upper ratchet teeth **22** of the screw cap **20**, the lower ratchet teeth **32** are formed by the inclined surfaces **32***a* and the vertical surfaces **32***b*. The lower ratchet teeth **32** are formed by eight ratchet teeth. In the ratchet joining, all the inclined surfaces **32***a* and all the vertical surfaces **32***b* are configured to come into contact with all the inclined surfaces **22***a* and all the vertical surfaces **22***b* of the upper ratchet teeth **22** of the screw cap **20**. In this embodiment, eight lower ratchet teeth **32** and eight upper ratchet teeth **22** are formed. However, the number of the lower ratchet teeth **32** and the upper ratchet teeth **22** is not limited to eight. An arbitrary number can be adopted.

At the opening end of the opener **30**, as shown in FIG. **3**B, a circumferential wall **32***c* having height same as the height of the lower ratchet teeth is provided in contact with the outer circumference of the eight lower ratchet teeth **32**. The circumferential wall **32***c* plays a function for guiding tooth tips of the upper ratchet teeth **22** when meshing with the upper ratchet teeth **22** and a function of assisting sealing from the side surface when the upper ratchet teeth **22** and the lower ratchet teeth **32** come into contact with each other over the entire circumference.

The circumferential wall **32***c* has action of, for example, reducing a risk of cutting a finger in the lower ratchet teeth **32** in a state in which the opener **30** is housed in the screw cap **20** in an inverted state and a state in which the opener **30** fits in the can upper lid opening after the film opening.

In a part on the opposite side (the inner diameter side) of one cap fitting projection **31**, a finger hook section **33** for facilitating the user to take out the opener **30** in a locked state from the inside of the can upper lid or the screw cap **20** may be formed.

An annular blade **34** is formed at the opening end on the opposite side of the lower ratchet teeth **32** (on the lower side during the opening operation) and, at the same time, a step surface **35** is formed with respect to the radial direction. As shown in FIG. **3**C, the annular blade **34** is asymmetrical blade configured in a relation of $\alpha>\beta$ such that a blade angle α in the tightening direction of the screw cap **20** with respect to the film **12** of the can upper lid is larger than a blade angle β in the loosening direction. By configuring the annular blade **34** in this way, a rear blade **34***b* of the annular blade **34** closes a cut end during cutting of the film **12** by a front blade **34***a* of the annular blade **34** while tracing the cut end. Scattering of the contents is suitably suppressed. Note that, as an example of the blade angles α and β, α is about 45° and β is about 15°.

As explained below with reference to FIG. **7**, a can fitting projection **36** for fitting with the annular curled section **11** of the can main body **10** after the film opening is formed on the outer circumferential surface of the annular blade **34**.

As shown in FIG. **3**A, a maximum envelope diameter D of the opener **30** (the diameter of a circle circumscribing the cap fitting projections **31**) is configured to be slightly smaller than a minimum inner diameter of ridge sections of the female screw **23** of the screw cap **20**. A difference between the maximum envelope diameter D and the minimum inner diameter of the screw ridges is set to a degree not exceeding the diameter of a curl of the annular curled section **11**, preferably, the radius of the curl. By configuring the maximum envelope diameter D in this way, even when the opener **30** is placed slightly deviating from the annular curled section **11** of the can upper lid, the opener **30** comes into contact with any one of the screw ridges of the female screw **23** of the screw cap **20** and is corrected to a correct position.

The opener cap in this embodiment is configured as explained above. Before the use (during the factory shipment), as shown in FIG. **4**, the opener is housed in the screw cap with the annular blade thereof facing upward.

That is, the opener **30** is housed on the inner side of the screw cap **20** in a state in which the annular blade **34** is housed on the inner side of the cylinder rib **21** (an inverted posture of the opener **30**). The screw cap **20** is fastened to the can main body **10** by screws. In this state, the cap fitting projections **31** of the opener **30** fit in the opener fitting annular groove **24** of the screw cap **20**. The annular blade **34** of the opener **30** is housed on the inner side of the cylinder rib **21** of the screw cap **20**. The upper ratchet teeth **22** at the opening end of the cylinder rib **21** of the screw cap **20** are protected by the opener **30**. The lower ratchet teeth **32** facing downward in the inverted state are held at height where the lower ratchet teeth **32** do not come into contact with the can upper lid. Therefore, the annular blade **34** does not carelessly pierce into a film surface of the container. The opener is stably held in the screw cap.

A method of cutting and opening a film, which seals a container, using the opener cap according to this embodiment having the configuration explained above is explained in detail with reference to FIGS. **5** to **7**.

FIG. **5** is a main part sectional explanatory diagram showing the opener cap **100** before the film opening.

The figure shows a state in which the screw cap **20** is loosened from the opener cap **100** in the state shown in FIG. **4** and separated from the can main body **10**, subsequently, the opener **30** is taken out from the screw cap **20** using the finger hook section **33** of the opener **30**, the opener **30** is reversed, and the opener **30** is placed on the film **12** of the can main body **10** such that the annular blade **34** is located in an inner side section (a section to be opened) of the annular curled section **11** of the can upper lid.

If the opener **30** is not correctly placed on the can upper lid, that is, when the axis of the opener **30** is attached deviating from the axis of the can main body **10**, as shown in FIG. **6**, the cap fitting projections **31** of the opener **30** come into contact with any one of screw ridges **23***t* of the female screw **23** of the screw cap **20**. The opener **30** is returned to the center and the deviation of the axis of the opener **30** is corrected.

In a form shown in FIG. **1**, the screw cap **20** is screwed into the can main body **10**, whereby the opener **30**, the deviation of the axis of which is corrected, joined to the screw cap **20** by ratchets integrally rotates and descends. The annular blade **34** cuts the film **12** of the can main body **10** in a circular shape.

FIG. **7** is a main part sectional explanatory diagram showing the opener cap **100** after the film opening.

In this state, the opening of the film **12** of the can main body **10** by the opener **30** is completed. The opener **30** fits in the annular curled section **11** of the can upper lid via a recess formed by the step surface **35** and the can fitting projection **36**. The annular blade **34** locks to the can upper lid in a state in which the annular blade **34** faces the inside of the can main body **10**. As a result, the annular blade **34** covers a cutting blade of the film bonded to and remaining on the can lid rear surface of the can main body. Therefore, it is possible to reduce a risk of cutting a finger tip at the cutting blade and prevent the cutting blade from being exposed to the opening and interrupting the contents to be taken out.

The screw cap **20** is screwed into the can main body **10**, whereby the screw cap **20** rotates and descends and compression-bonds a ratchet-joined section of the screw cap **20** and the opener **30** and, at the same time, compression-bonds a joined section of the annular curled section **11** of the can upper lid and the step surface **35** of the opener **30**. Consequently, both the joined sections function as sealing sections and prevent the contents of the can main body **10** from spilling.

As explained above, in the opener cap **100**, after the can main body **10** and the screw cap **20** are fastened by screws, the screw cap **20** and the opener **30** are joined by ratchets with a delay. In this way, the can main body **10** and the screw cap **20** are fastened by screws first, whereby the axis of the screw cap **20** serving as a reference in cutting of the film **12** by the opener **30** (during the film opening) is determined. Thereafter, the screw cap **20** and the opener **30** are joined by ratchets, whereby centering of the opener **30** in the film opening is suitably performed.

As it is evident from the figures, the ratchet joining of the screw cap **20** and the opener **30** is so-called entire circumference contact in which entire joining surfaces thereof are in contact with each other. Consequently, after the opener **30** opens the film remaining in the annular curled section **11**, the screw cap **20** is tightened (screwed) into the can main body **10**, whereby a ratchet contact portion of the screw cap **20** and the opener **30** also function as a sealing section in addition to the joined section (see FIG. **7**) of the opener **30** and the annular curled section **11**. Even when the can main body **10** turns over or inverts, the contents do not spill over the can

upper lid. Note that, since the opener **30** remains on the can upper lid in a state in which the annular blade **34** faces the inside of the can main body **10** after the film opening, a risk that the user's finger is cut by the annular blade during use decreases.

The annular blade of the opener **30** is a so-called asymmetrical blade. A blade angle in the loosening direction of the screw cap **20** is gentle compared with a blade angle in the tightening direction. The blade angles of the annular blade are set asymmetrical in this way, whereby the rear blade closes a cut end by the front blade. Scattering of the contents is suitably suppressed.

Further, during the film opening when the annular blade cuts the film, the entire upper lid of the can main body **10** is covered by the screw cap **20**. Therefore, the contents do not scatter to the outside of the can main body **10**.

INDUSTRIAL APPLICABILITY

The opener cap of the present invention can be applied to various content filled containers as an over-cap for performing opening and resealing after the opening of a container such as a positive pressure can, a normal pressure can, or a negative pressure can, an opening of which includes a sealing film section. In particular, the opener cap of the present invention can be suitably applied to a positive pressure can in which an inert gas is filled and a section to be opened is sealed by a gas barrier film like a coffee beans/ground coffee can.

The invention claimed is:

1. An opener cap, comprising:

a screw cap including a female screw configured to be joined with a male screw formed in a side-surface upper part of a can main body, the screw cap including a cylinder rib projecting downward from a top plate rear surface of the screw cap and upper ratchet teeth formed at an opening end of said cylinder rib, the upper ratchet teeth projecting downward from said top plate rear surface, and

an opener including an annular blade for cutting a film serving as a section to be opened and lower ratchet teeth formed at an opening end of the opener, the lower ratchet teeth projecting in an opposite direction from the annular blade,

wherein the film seals an upper lid in which an opening of the can main body is formed,

wherein the opener capable of being housed in the screw cap with the annular blade facing upward before use, and capable of remaining in the opening of the upper lid after opening of the film,

wherein the upper ratchet teeth and the lower ratchet teeth mesh with each other only in a tightening direction of the screw cap,

wherein the upper ratchet teeth comprise an inclined surface which faces substantially downward in an axial direction of the screw cap,

wherein the lower ratchet teeth comprise an inclined surface which faces substantially upward in an axial direction of the opener, and

wherein the inclined surface of the upper ratchet teeth engages with the inclined surface of the lower ratchet teeth.

2. The opener cap according to claim **1**, wherein the upper ratchet teeth and the lower ratchet teeth mesh with each other subsequent to the start of meshing of the female screw of the screw cap and the male screw of the can main body.

3. The opener cap according to claim **1**, wherein the upper ratchet teeth of the screw cap and the lower ratchet teeth of the opener are formed in a relation in which the upper ratchet teeth and the lower ratchet teeth can come into contact with each other over entire circumferences thereof.

4. The opener cap according to claim **1**, wherein a maximum envelope diameter of the opener is set slightly smaller than a minimum inner diameter of ridge sections of the female screw of the screw cap.

5. The opener cap according to claim **1**, wherein the annular blade of the opener is an asymmetrical blade, a blade angle of which in a loosening direction of the screw cap is set smaller than a blade angle in a tightening direction of the screw cap.

6. The opener cap according to claim **2**, wherein the upper ratchet teeth of the screw cap and the lower ratchet teeth of the opener are formed in a relation in which the upper ratchet teeth and the lower ratchet teeth can come into contact with each other over entire circumferences thereof.

7. The opener cap according to claim **1**,

wherein the upper ratchet teeth further comprise a vertical surface which extends substantially in the axial direction of the screw cap,

wherein the lower ratchet teeth further comprise a vertical surface which extends substantially in the axial direction of the opener,

wherein the vertical surface of the upper ratchet teeth engages with the vertical surface of the lower ratchet teeth.

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